U.S. Department
of Transportation
Federal Highway
Administration

Research and Development

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ITS OPERATIONAL TEST SUMMARY

MULTI-JURISDICTIONAL LIVE-AERIAL VIDEO SURVEILLANCE SYSTEM-VIRGINIA

Introduction

This project was a demonstration of the use of live aerial video recorded from a rotary wing aircraft operated by the Fairfax County, Virginia Police Department and transmitted to ground stations for re-transmission and use by Fairfax County and Virginia Department of Transportation (VDOT) for incident and congestion management. The demonstration occurred over an eight month period from July, 1993 to April, 1994.

Purpose

The project evaluation focus on three main objectives:

1. The capture and transmission of the video picture
2. Related institutional issues
3. The utility of the information for incident management and traffic control.

Methodology

Three Fairfax County police helicopters were provided fittings that allowed a combination of forward-looking infrared (FLIR) and video cameras, since none of the other police missions could be compromised for this test. The cameral weighed less than 100 pounds, has a three (3) watt power output that limits transmission range to only 20 miles. The configuration of the test is illustrated in Figure 1.

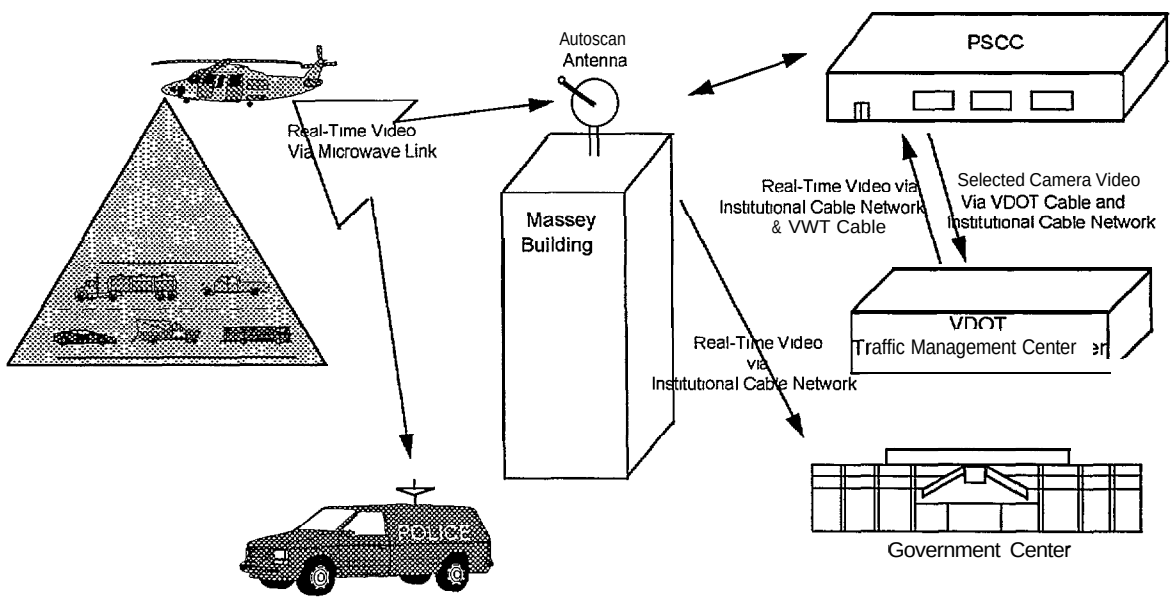

Figure 1. Live Aerial Video System High-Level Configuration

The six power camera sent it's images to the operator's video monitor, the 8mm video cassette recorder and the microwave transmitter. The transmitted video was sent to the ground station (Massey Building in Fairfax City) through a pole-mounted, rotating antenna and re-transmitted to the Fairfax County Public Safety Communications Center (PSCC) and VDOT Traffic Management Center in Arlington and a Fairfax County Police Department van.

The helicopter flew twice a day, during peak traffic hours, over a set flight path that was only interrupted for real-world situations. Special coordination was required for this operation, since a the helicopter was a police asset (although the police and VDOT coordinate very closely on a daily basis in response to incidents and congestion).

Results

The use of aerial video by a transportation agency offers distinct benefits for both real-time traffic operations and long-term analysis. The key purpose is effective communications of traffic conditions to the traffic management agency, the motoring public and decision makers. Real-time benefits resulting from enhanced communication during an incident include:

- Effective selection of an alternate route
- Rapid identification of secondary incidents
- Efficient deployment of response resources.

Although no special events were handled with the use of live aerial video, it was clear that the benefits of having video for such events would be significant. Off-line capabilities include rapid, cost-effective analysis of current and future traffic conditions, and an illustrated view of a jurisdiction's incident response procedures.

Institutional issues included the following:

Ethical conflicts -showing of incident details to the general public
Potential for a public organization to give or sell aerial video information to private traffic information services
- Potential for a private traffic information service to provide the same service to a public transportation agency.

Future Application

VDOT and Fairfax County continue to use this system for incident response and training purposes. Live aerial video is viewed as a vital asset to their daily operations.

References

1. Demetsky, Evaluation of Live Aerial Video for Traffic Management (Draft), Virginia Department of Transportation, Transportation Research Council, July, 1994.